

FOR ERRATA

AD 406916

THE FOLLOWING PAGES ARE CHANGES

TO BASIC DOCUMENT

406916

ACTIVE PAGE RECORD

SECTION	ORIG REL PAGE NO.	REV SYM	ADDED PAGES			SECTION	ORIG REL PAGE NO.	REV SYM	ADDED PAGES		
			PAGE NO.	REV SYM	PAGE NO.				PAGE NO.	REV SYM	PAGE NO.
1									49	A	
2									50	A	
3									51	A	
4									52	A	
5									53	A	
6									54	A	
7									55	A	
8									56	A	
9									57	A	
10									58	A	
11									59	A	
12									60	A	
13									61	A	
14									62	A	
15									63	A	
16									64	A	
17									65	A	
18									66	A	
19									67	A	
20									68	A	
21									69	A	
22									70	A	
23									71	A	
24									72	A	
25									73	A	
26									74	A	
27									75	A	
28									76	A	
29									77	A	
30									78	A	
31									79	A	
32									80	A	
33									81	A	
34									82	A	
35									83	A	
36									84	A	
37									85	A	
38									86	A	
39									87	A	
40									88	A	
41									89	A	
42									90	A	
43									91	A	
44									92	A	
45									93	A	
46									94	A	
47									95	A	
48									96	A	

US 4801 0660 ORIG. 8/62

2-5142-2

REV SYM 2

BOEING

NO. D2-13943-2

SECT.

PAGE

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ACTIVE PAGE RECORD

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			PAGE NO.	REV SYM	PAGE NO.	REV SYM				PAGE NO.	REV SYM	PAGE NO.	REV SYM
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	98	D						146	E				
	99	D						147	E				
	100	D						148	E				
	101	D						149	E				
	102	D						150	E				
	103	D						151	E				
	104	D						152	E				
	105	D						153	E				
	106	D						154	E				
	107	D						155	E				
	108	D						156	E				
	109	D						157	E				
	110	D						158	E				
	111	D						159	F				
	112	D						160	F				
	113	E						161	F				
	114	E						162	F				
	115	E						163	F				
	116	E						164	F				
	117	E						165	F				
	118	E						166	F				
	119	E						167	F				
	120	E						168	F				
	121	F						169	F				
	122	F						170	F				
	123	F						171	F				
	124	F						172	F				
	125	F						173	F				
	126	F						174	F				
	127	F						175	F				
	128	F						176	F				
	129	F						177	F				
	130	F						178	F				
	131	D						179	F				
	132	D						180	F				
	133	D						181	F				
	134	D						182	F				
	135	D						183	F				
	136	D						184	F				
	137	D						185	F				
	138	D						186	F				
	139	D						187	F				
	140	D						188	F				
	141	D						189	F				
	142	D						190	F				
	143	D						191	F				
	144	D											

US 4801 0800 ORIG. 8/82

2-8142-8

REV SYM 7

BOEING

NO. D2-13943-2

SECT.

PAGE 2,1

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
A	<p>Revised Page 4</p> <p>Added Pages 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51</p> <p>Added Sections 4.0 and 5.0 to the document.</p>	6-17-63	D. Brenden J. Brenden
B	Revised Pages 34, 35, 36, 37, 38, 39, 40, 41, 42	7-17-63	D. Brenden J. Brenden
C	<p>Revised Pages 2, 3, 4</p> <p>Added Pages 4.1, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76,</p>	8-16-63	D. Brenden J. Brenden
D	<p>Revised Pages 2, 3, 4, 4.1, 6, 52, 53, 54, 55, 61, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76.</p> <p>Added Pages 2.1, 4.2, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139.</p>	10-16-63	D. Brenden J. Brenden
E	<p>Revised Pages 2, 2.1, 3, 4.2, 114, 115, 116, 117, 118, 119, 120, 121, 113</p> <p>Added Pages 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155.</p>	11-18-63	D. Brenden J. Brenden
F	<p>Revised Pages 2, 2.1, 3, 4.2, 122, 123, 124, 125, 126, 127, 128, 129, 130</p> <p>Added Pages 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191.</p>	12-18-63	D. Brenden J. Brenden

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19.2	WEIGHT AND BALANCE SUMMARY
19.3	MISSILE SECTION SUMMARY CHECK LISTS
19.4	SECTION 39 DATA
19.5	ENGINEERING CHANGE PROPOSAL

CTLI SECTION, S/N 0000045

13.1

This section of the document describes the data changes created by converting a production line Minuteman missile into a CTLI missile. The mass data reported herein reflect the predicted net changes to be applied to the total missile mass properties when this CTLI section and the related downstage components are installed on a missile. A supplemental report (see reference 1.1.6) will be issued at Vandenberg Air Force Base when this CTLI section is actually used on a missile. This supplemental report will reflect the actual data gathered on base during the installation and will thus supersede parts of this report. However, past experience has shown that the changes between these two reports will be slight.

The data on the following pages consist of weight and balance summaries check lists, and ECP's lists applicable to this installation. Page 123 summarizes the complete installation mass properties and consists of data from page 124 (average mass properties of downstage components), page 125 (predicted sealant changes), and page 129 (actual weight of CTLI section S/N 0000045). In addition, page 126 presents summary check lists by production section as backup data for page 124. Page 130 lists the engineering change proposals incorporated on the components used for this installation.

All data reported in this section of the document reflect the use of a linear shaped charge destruct system on the first stage engine per ECP 116.

Aerojet weights used in this report reflect the data transmitted to Boeing by Aerojet document 0162-01DP-NMPD-1, "Nominal Mass Properties and Dispersions for Minuteman CTLI/AODE" dated January 28, 1963.

Average values have been used for all Boeing items other than the CTLI section which is an actual weight.

The following drawings are incorporated in the above section:

10-20942, Battery Instl., Rev. H 6-10-63.
21-52900, Missile Instl., Rev. K 9-19-63.
25-25406, EMS 5-62 Instl., DCN J 9-13-63.
25-26878, Cable Assy., DCN J 9-3-63.
25-37060, Conduit Assy., DCN B 9-10-63, ADCN S-20 10-22-63.
25-37236, Instl. Kit, DCN C 6-28-63.
25-37237, Conduit Supt. Set, DCN A 5-10-63.
25-37501, 39 Sect. Instl., DCN C 11-5-63.
29-22327, Timer Instl., DCN D 6-24-63, ADCN S-6 9-5-63.

13.2 WEIGHT & BALANCE SUMMARY TOTAL CTLI KIT INSTALLATION CTLI WAFER S/N 0000045					REPORT NO. _____				
ITEM	DESCRIPTION	DATA	EXPENDED WEIGHT (LB)	TOTAL WEIGHT (LB)	CENTER OF GRAVITY			INERTIA SLUG FT ² x 10 ⁻³	
					LONG.	LAT.	VERT.	ROLL	PITCH
1 41	HV Spacer								
2		Silo							
3		Aero							
4 39	CTLI Section			147.81	54.8	99.7	100.1	.004	.002
5		Silo							
6		Aero							
7 42	O&C Section			5.56	67.9	111.7	114.7	0	0
8		Silo							
9		Aero							
10 44	3rd Stage Engine			16.65	85.9	108.5	117.0	0	.002
11		Silo							
12		Aero							
13		Base							
14 45	Interstage 2-3 (Fwd)			- 1.32	56.3	109.8	117.7	0	0
15		Silo							
16		Aero							
17		Base							
18		Silo							
19	Jettisoned Portion								
20		Aero							
21		Base							
22	Jett	- 1.32			56.3	109.8	117.7		
23 45	Interstage 2-3 (Aft)			18.64	64.7	111.8	120.2		
24		Silo							
25		Aero							
26 46	2nd Stage Engine			26.00	99.9	112.7	121.8	0	.009
27		Silo							
28		Aero							
29		Base							
30 47	Interstage 1-2 (Fwd)			- .98	58.2	113.6	123.8	0	0
31		Silo							
32		Aero							
33		Base							
34		Silo							
35	Jettisoned Portion								
36		Aero							
37		Base							
38	Jett	- .98			58.2	113.6	123.8		
39 47	Interstage 1-2 (Aft)			25.26	74.0	114.8	125.2	0	.002
40		Silo							
41		Aero							
42		Base							
43 48	1st Stage Engine			26.10	117.2	117.7	130.1	0	.023
44		Silo							
45		Aero							
46		Base							
47 49	Skirt			7.78	74.5	118.1	129.6	0	0
48		Silo							
49		Aero							
50		Base							
51									
52	Jett								
48	MISSILE			272.10					
49		Silo							
50		Aero							
51		Base							
52									

* Boeing Section Stations (See Missile Station Diagram)

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13.2 WEIGHT & BALANCE SUMMARY CTLI
(AVERAGE WEIGHT COMPONENTS)

REPORT NO. _____

DATE _____

ITEM	DESCRIPTION	DATA	EXPENDED WEIGHT (LB)	TOTAL WEIGHT (LB)	CENTER OF GRAVITY			INERTIA SLUG FT ² x 10 ⁻³	
					LONG.	LAT.	VERT.	ROLL	PITCH
1 41	RV Spacer								
2		Silo							
3		Aero							
4 39	CTLI Section		3.42	56.9	108.4	112.4	0		0
5		Silo							
6		Aero							
7 42	G&C Section		5.16	68.1	111.8	114.8	0		0
8		Silo							
9		Aero							
10 44	3rd Stage Engine		16.45	86.0	108.5	117.0	0		.002
11		Silo							
12		Aero							
13		Base							
14 45	Interstage 2-3 (Fwd)		- 1.52	55.9	109.9	117.6	0		0
15		Silo							
16		Aero							
17		Base							
18		Silo							
19	Jettisoned Portion								
20		Aero							
21		Base							
21	Jett	- 1.52		55.9	109.9	117.6			
22 45	Interstage 2-3 (Aft)		18.44	64.8	111.8	120.2	0		.001
23		Silo							
24		Aero							
25 46	2nd Stage Engine		26.00	99.9	112.7	121.8	0		.009
26		Silo							
27		Aero							
28		Base							
29 47	Interstage 1-2 (Fwd)		- .98	58.2	113.6	123.8	0		0
30		Silo							
31		Aero							
32		Base							
33		Silo							
34	Jettisoned Portion								
35		Aero							
36		Base							
36	Jett	- .98		58.2	113.6	123.8			
37 47	Interstage 1-2 (Aft)		24.76	73.6	115.1	125.6	0		.002
38		Silo							
39		Aero							
40 48	1st Stage Engine		25.90	115.8	117.7	130.2	0		.023
41		Silo							
42		Aero							
43		Base							
44 49	Skirt		7.58	73.8	118.1	129.5	0		0
45		Silo							
46		Aero							
47		Base							
48	MISSILE			125.21					
49		Silo							
50		Aero							
51		Base							
52		Jett							

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13.2 EMB 5-62 CHARGES INSTALLED AT
VANDENBERG AIR FORCE BASE*

REPORT NO. _____

DATE _____

LINE	NO.	DESCRIPTION	DATA	EXPENDED WEIGHT (LB)	TOTAL WEIGHT (LB)	CENTER OF GRAVITY			INERTIA SLUG FT ² x 10 ⁻³	
						LONG.	LAT.	VERT.	ROLL	PITCH
1	41	RV Spacer								
2			Silo							
3			Aero							
4	39	CTLI Section			.2	54.5	111.5	111.5		
5			Silo							
6			Aero							
7	42	O&C Section			.4	65.4	110.5	113.5		
8			Silo							
9			Aero							
10	44	3rd Stage Engine			.2	80.9	109.3	116.2		
11			Silo							
12			Aero							
13			Base							
14	45	Interstage 2-3 (Fwd)			.2	53.6	110.8	116.7		
15			Silo							
16			Aero							
17			Base							
18			Silo							
19		Jettisoned Portion								
20			Aero							
21			Base							
22	45	Interstage 2-3 (Aft)			.2	53.6	110.8	116.7		
23			Silo							
24			Aero							
25	46	2nd Stage Engine			0	-	-	-		
26			Silo							
27			Aero							
28			Base							
29	47	Interstage 1-2 (Fwd)			0	-	-	-		
30			Silo							
31			Aero							
32			Base							
33			Silo							
34		Jettisoned Portion								
35			Aero							
36			Base							
37	47	Interstage 1-2 (Aft)			.5	94.7	102.0	103.4		
38			Silo							
39			Aero							
40	48	1st Stage Engine			.8	161.3	116.2	128.0		
41			Silo							
42			Aero							
43			Base							
44	49	Skirt			.2	101.3	119.2	133.9		
45			Silo							
46			Aero							
47			Base							
48		MISSILE			2.7					
49			Silo							
50			Aero							
51			Base							
52			Jett							

* Reference D2-13943-534

245450-0-58

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SEC

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RECORD OF CHECKING (DATE)			
CHECK LIST NO.	13.3	MISSILE WEIGHING CHECK LIST	
DATE	Model	FINAL ASSEMBLY DRAWING NO. _____	
		MISSILE NO. _____	
SECTION 32 THRU 49		COMPONENT PART NO. _____	
MISSILE COMPONENT		PART NO.	WEIGHT
DESCRIPTION		X	ARM
		Y	ARM
		Z	ARM
REMOVED SITE AS RECEIVED			
REMOVED SITE AS WEIGHED			
LAUNCH			

3-5550-0-31

July, 1961.

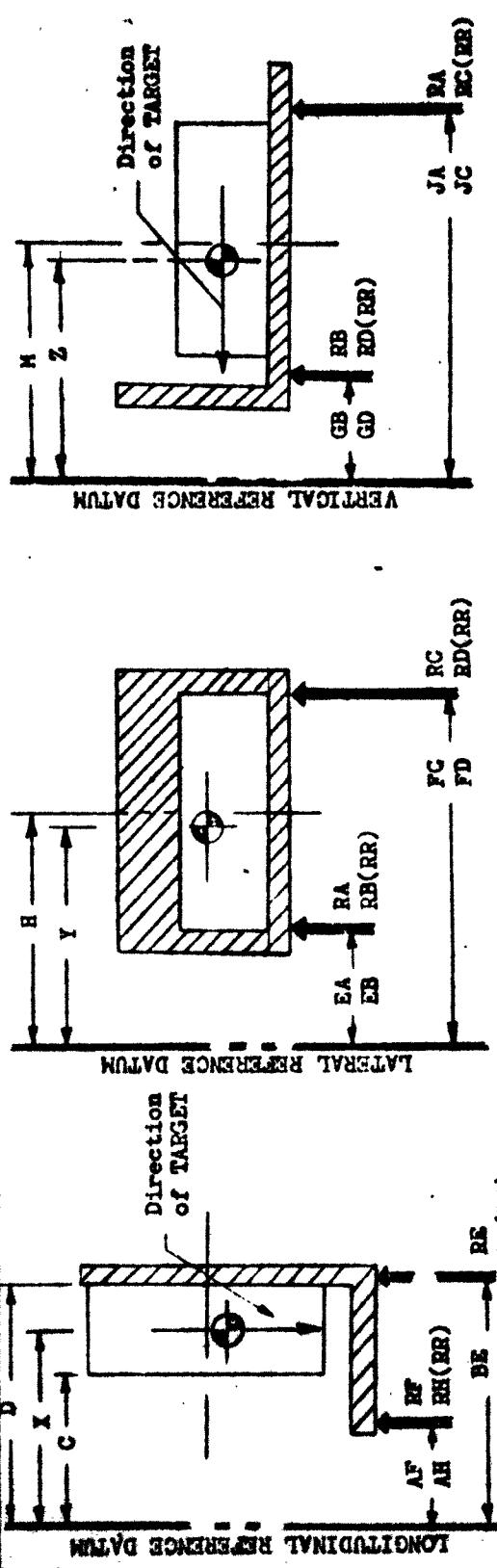
NO. D2-13943-2

PAGE

13.4.1
U/O MISSILE 0000045
MISSILE MODEL MB-133A
CONFIGURATION

ACTUAL WEIGHT RECORD - CIVL SECTION
DRAWING NO. 25-37501-9
DCN 01
ADCN

CHECK LIST NO. 39
REPORTED BY CH-34
CHECKED BY H



WEIGHING DATA

REACTION	GR. WT.	TARE	CORR.	NET WT.	REACTION	GR. WT.	TARE	CORR.	NET WT.	REACTION	GR. WT.	TARE	CORR.	NET WT.	REACTION	GR. WT.	TARE	CORR.	NET WT.	REACTION	GR. WT.	TARE	CORR.	NET WT.	REACTION	GR. WT.	TARE	CORR.	NET WT.	REACTION	GR. WT.	TARE	CORR.	NET WT.					
RF	56.30	22.60	33.70	32.65	RC	61.30	26.65	31.65	31.65	AF	42.00	14.50	31.50	31.47	BB	51.00	21.40	31.40	31.40	AB	51.00	21.40	31.40	31.40	CD	50.50	21.30	31.30	31.30	GD	77.47	27.47	50.00	50.00					
RH	53.20	29.80	24.10	29.90	RD	50.00	62.20	27.80	27.80	AH	42.02	21.30	31.30	31.30	BB	50.50	21.40	31.40	31.40	CD	77.48	27.48	50.00	50.00	GD	77.48	27.48	50.00	50.00	JA	115.49	49.00	115.00	115.00					
RE	104.80	64.80	40.00	61.00	RA	65.80	42.00	43.80	43.80	BE	62.98	42.00	41.98	41.98	FC	115.49	49.00	115.00	115.00	GD	115.49	49.00	115.00	115.00	JA	115.50	50.00	115.00	115.00	RC	37.65	115.50	37.65	37.65					
RU	101.20	59.35	41.85	59.35	RB	76.20	45.80	30.40	30.40	BG	62.98	42.00	41.98	41.98	FC	115.49	49.00	115.00	115.00	GD	115.49	49.00	115.00	115.00	JA	115.50	50.00	115.00	115.00	RC	100.00	100.00	100.00	100.00					
TOTAL	316.20	176.55	139.65	139.65	TOTAL	316.30	176.65	139.65	139.65	C	50.00	115.50	37.65	37.65	D	60.00	115.50	37.65	37.65	AS	139.65	139.65	139.65	139.65	GD	139.65	139.65	139.65	139.65	AS	139.65	139.65	139.65	139.65	GD	139.65	139.65	139.65	139.65

DIMENSIONAL DATA

	LONGITUDINAL REFERENCE DATUM	LATERAL REFERENCE DATUM	VERTICAL REFERENCE DATUM	LONGITUDINAL REFERENCE DATUM	LATERAL REFERENCE DATUM	VERTICAL REFERENCE DATUM	
REACTION	NET WT.	ARM	ARM	REACTION	NET WT.	ARM	ARM
RF	33.70	42.00	42.00	RA	43.80	84.50	84.50
RH	24.10	42.02	42.02	RB	30.40	84.50	84.50
RE	40.00	62.98	62.98	RC	37.65	115.49	115.49
RU	41.85	62.99	62.99	RD	27.80	115.49	115.49
AS	139.65	51.31	71.58	AS	139.65	13.82	29.4
GD	139.65	51.31	71.58	GD	30.40	77.47	77.47
CD	139.65	51.31	71.58	CD	27.80	77.48	77.48
JA	139.65	51.31	71.58	JA	43.80	115.50	115.50
RC	139.65	51.31	71.58	RC	37.65	115.50	115.50
GD	139.65	51.31	71.58	GD	100.00	100.00	100.00

RE

CD

JA

RC

GD

AS

GD

CD

JA

RC

SERIAL NUMBER: 0000045

CHECK LIST NO. 39	DATE	13.4.2 MISSILE WEIGHING CHECK LIST		RECORD OF CHECKING (DATE)	
		ITEM NUMBER	DESCRIPTION	MISSILE NO. 39	
				SECTION	MISSILE PART NO.
		39	Instrumentation Group, Trainer-Test	25-37501-9	
		39a	Cell Structure Assembly	25-25403-11	
			Support Structure	25-29094-45	x x
			Primary Structure	25-29093-15	x x
			Insulation & External Marting	25-29095-3	x x
			Antenna & Spacer	25-29096-3	x x
			Plate - Identification	21-51600-329	x x
		39b	Cable & Equipment Installation	25-25404-15	- -
			Battery, Series	10-20942-4	x x
			Battery, Series	10-20942-2	x x
			Cable Set, SR-35R	55018-106	- -
			Cable	AN 31192-315	x x
			Cable	AN 31194-315	x o
			Cable	AN 31196-315	x o

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WEIGHT AND BALANCE CHANGE RECORD

ASSOCIATE CONTRACTOR	BOEING	CONTRACT NO.	WIB-1128-045
COMPONENT	SECTION 39	LOT NO.	11-12-63
MODEL NO.	WB-133A	DRAWING NO.	25-37501-9
SERIAL NO.	00000045	U.O. MISSILE	00

REPORT NO. WIB-1128-045
 DATE 11-12-63
 PREPARED BY
 APPROVED BY

EQUIPMENT CHANGE RECORD

LINE	PART NO.	DESCRIPTION OF EQUIPMENT	WEIGHT AND BALANCE					
			WEIGHT	X AXIS	Y AXIS	Z AXIS	ARM	ARM
1								
2	25-37501-9	Instr. Group Trainer (As Weighed)	139.65	54.31	7.584.8	99.03	13,829.4	99.65
3								
4								
5								
6	AM37194-315	Cable-Autometrics	3.20	74.2	115.5	102.8		
7	AM37196-315	Cable-Autometrics	1.34	50.4	106.9	111.4		
8								
9								
10								
11	25-37501-9	Instr. Group Trainer (Complete)	144.19	54.72	7.889.8	99.47	14,342.2	99.83
12								
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13.5

**ENGINEERING CHANGE PROPOSAL (ECP) INCORPORATION
APPLICABLE TO CTEI SECTION S/N 0000045 AND INSTALLATION KIT**

The following ECP's have not been incorporated into "Model Specification, Trainer-Test Group, Guided Missile, (S-133-1006-0-1)".

ECP NO. (WS-133A-BO-)	ECP TITLE	STAGE	WEIGHT CHANGE	WEIGHT CHANGE INCORPORATED IN THIS REPORT
540	Potting & Bonding Deletions for Vandenberg Air Force Base Missiles	All	-	No*
606	Revision to CTEI Umbilical Bracket-Section 49	1	Negl.	Yes
620	Addition of Static Dissipators on 47 Section & Section 49	1	Negl.	Yes
635	PCM R/F Section Digital Data Programmer	3	Negl.	Yes
639	Prevent Interference of Linear Shape Charge with Cable Strap	3	Negl.	Yes
657	Revision of Ordnance Supports in Interstage 2-3	2	Negl.	Yes
660	Wing III Q&C Section & Raceway Revisions	3	Negl.	Yes

Mass properties of other applicable ECP's have been incorporated

* ECP 540 transfers the responsibility for sealing the raceway covers from Plant 77 to Vandenberg. However, the weight is still considered part of the operational missile and is not included in this report.

CTLI SECTION, S/N 0000048

16.1 This section of the document describes the data changes created by converting a production line Minuteman missile into a CTLI missile. The mass data reported herein reflect the predicted net changes to be applied to the total missile mass properties when this CTLI section and the related downstage components are installed on a missile. A supplemental report (see reference 1.1.6) will be issued at Vandenberg Air Force Base when this CTLI section is actually used on a missile. This supplemental report will reflect the actual data gathered on base during the installation and will thus supersede parts of this report. However, past experience has shown that the changes between these two reports will be slight.

The data on the following pages consists of weight and balance summaries check lists, and ECP's lists applicable to this installation. Page 157 summarizes the complete installation mass properties and consists of data from page 158 (average mass properties of downstage components), page 159 (predicted sealant changes), and page 163 (actual weight of CTLI section S/N 0000048). In addition, page 160 presents summary check lists by production section as backup data for page 158. Page 164 lists the engineering change proposals incorporated on the components used for this installation.

All data reported in this section of the document reflect the use of a linear shaped charge destruct system on the first stage engine per ECP 116.

AeroJet weights used in this report reflect the data transmitted to Boeing by AeroJet document 0162-01DR-NMPD-1, "Nominal Mass Properties and Dispersions for Minuteman CTLI/AODS" dated January 28, 1963.

Average values have been used for all Boeing items other than the CTLI section which is an actual weight.

The following drawings are incorporated in the above section:

10-20942, Battery Instl., Rev. H 6-10-63.
21-52900, Missile Instl., Rev. K 9-19-63.
25-25406, EMS 5-62 Instl., DCN J 9-13-63.
25-26878, Cable Assy., DCN J 9-3-63.
25-37060, Conduit Assy., DCN B 9-10-63, ADCN S-20 10-22-63.
25-37236, Instl. Kit, DCN C 6-28-63.
25-37237, Conduit Supt. Set, DCN A 5-10-63.
25-37501, 39 Sect. Instl., DCN C 11-5-63.
29-22327, Timer Instl., DCN D 6-24-63, ADCN S-6 9-5-63.

16.2 WEIGHT & BALANCE SUMMARY TOTAL CTELI KIT INSTALLATION CTELI WAFER S/N 0000048						REPORT NO. _____				
ITEM #	DESCRIPTION	DATA	EXPENDED WEIGHT (LB)	TOTAL WEIGHT (LB)	CENTER OF GRAVITY	INERTIA SLUG FT ² x 10 ⁻³				
						LONG.*	LAT.	VERT.	ROLL	PITCH
1 41	RV Spacer									
2		Silo								
3		Aero								
4 39	CTELI Section			147.24	54.7	99.7	100.1	.004	.002	
5		Silo								
6		Aero								
7 42	G&C Section			5.56	67.9	111.7	114.7	0	0	
8		Silo								
9		Aero								
10 44	3rd Stage Engine			16.65	85.9	108.5	117.0	0	.002	
11		Silo								
12		Aero								
13		Base								
14 45	Interstage 2-3 (Fwd)			- 1.32	56.3	109.8	117.7	0	0	
15		Silo								
16		Aero								
17		Base								
18		Silo								
19	Jettisoned Portion									
20		Aero								
21		Base								
	Jett	- 1.32			56.3	109.8	117.7			
22 45	Interstage 2-3 (Aft)			18.64	64.7	111.8	120.2	0	.001	
23		Silo								
24		Aero								
25 46	2nd Stage Engine			26.00	99.9	112.7	121.8	0	.009	
26		Silo								
27		Aero								
28		Base								
29 47	Interstage 1-2 (Fwd)			- .98	58.2	113.6	123.8	0	0	
30		Silo								
31		Aero								
32		Base								
33		Silo								
34	Jettisoned Portion									
35		Aero								
36		Base								
	Jett	- .98			58.2	113.6	123.8			
37 47	Interstage 1-2 (Aft)			25.26	74.0	114.8	125.2	0	.002	
38		Silo								
39		Aero								
40 48	1st Stage Engine			26.70	117.2	117.7	130.1	0	.023	
41		Silo								
42		Aero								
43		Base								
44 49	Skirt			7.78	74.5	118.1	129.6	0	0	
45		Silo								
46		Aero								
47		Base								
48	MISSILE			271.53						
49		Silo								
50		Aero								
51		Base								
52		Jett								

* Boeing Section Stations (See Missile Station Diagram)

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16.2 WEIGHT & BALANCE SUMMARY CTLI
(AVERAGE WEIGHT COMPONENTS)

REPORT NO. _____

DATE _____

ITEM	DESCRIPTION	DATA	EXPENDED WEIGHT (LB)	TOTAL WEIGHT (LB)	CENTER OF GRAVITY			INERTIA SLUG FT ² x 10 ⁻³	
					LONG.	LAT.	VERT.	ROLL	PITCH
1	41 RV Spacer								
2		Silo							
3		Aero							
4	39 CTLI Section			3.42	56.9	108.4	112.4	0	0
5		Silo							
6		Aero							
7	42 G&C Section			5.16	68.1	111.8	114.8	0	0
8		Silo							
9		Aero							
10	44 3rd Stage Engine			16.45	86.0	108.5	117.0	0	.002
11		Silo							
12		Aero							
13		Base							
14	45 Interstage 2-3 (Fwd)		- 1.52	55.9	109.9	117.6	0	0	
15		Silo							
16		Aero							
17		Base							
18		Silo							
19	Jettisoned Portion								
20		Aero							
21		Base							
22	45 Interstage 2-3 (Aft)		- 1.52	55.9	109.9	117.6			
23		Silo							
24		Aero							
25	46 2nd Stage Engine			26.00	99.9	112.7	121.8	0	.009
26		Silo							
27		Aero							
28		Base							
29	47 Interstage 1-2 (Fwd)		- .98	58.2	113.6	123.8	0	0	
30		Silo							
31		Aero							
32		Base							
33		Silo							
34	Jettisoned Portion								
35		Aero							
36		Base							
37	47 Interstage 1-2 (Aft)		- .98	58.2	113.6	123.8			
38		Silo							
39		Aero							
40	48 1st Stage Engine			25.90	115.8	117.7	130.2	0	.023
41		Silo							
42		Aero							
43		Base							
44	49 Skirt			7.58	73.8	118.1	129.5	0	0
45		Silo							
46		Aero							
47		Base							
48	MISSILE			125.21					
49		Silo							
50		Aero							
51		Base							
52		Jett							

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16.2 INS 5-62 CHARGES INSTALLED AT
VANDENBERG AIR FORCE BASE

REPORT NO. _____

DATE _____

LINE	NO.	DESCRIPTION	DATA	EXPENDED WEIGHT (LB)	TOTAL WEIGHT (LB)	CENTER OF GRAVITY			INERTIA SLUG FT ² x10 ⁻³	
						LONG.	LAT.	VERT.	ROLL	PITCH
1	41	RV Spacer								
2			Silo							
3			Aero							
4	39	CTL Section			.2	54.5	111.5	111.5		
5			Silo							
6			Aero							
7	42	G&C Section			.4	65.4	110.5	113.5		
8			Silo							
9			Aero							
10	44	3rd Stage Engine			.2	80.9	109.3	116.2		
11			Silo							
12			Aero							
13			Base							
14	45	Interstage 2-3			.2	53.6	110.8	116.7		
15			(Fwd)							
16			Silo							
17			Aero							
18			Base							
19		Jettisoned								
20		Portion								
21			Jett	.2		53.6	110.8	116.7		
22	45	Interstage 2-3			.2	53.6	110.8	116.7		
23			(Aft)							
24			Silo							
25	46	2nd Stage Engine			0	-	-	-		
26			Silo							
27			Aero							
28			Base							
29	47	Interstage 1-2			0	-	-	-		
30			(Fwd)							
31			Silo							
32			Aero							
33			Base							
34		Jettisoned								
35		Portion								
36			Jett							
37	47	Interstage 1-2			.5	94.7	102.0	103.4		
38			(Aft)							
39			Silo							
40	48	1st Stage Engine			.8	161.3	116.2	128.0		
41			Silo							
42			Aero							
43			Base							
44	49	Skirt			.2	101.3	119.2	133.9		
45			Silo							
46			Aero							
47			Base							
48		MISSILE			2.7					
49			Silo							
50			Aero							
51			Base							
52			Jett							

* Reference 10-13954-534

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0000048
EQUIPMENT NUMBER:

RECORD OF CHECKING (DATE)	
10	11
12	13
13	63

16.4.2 MISSILE WEIGHING CHECK LIST

111

INTERNAL ASSISTANT DRAWING NO. 25-3502-6

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16.4.3

WEIGHT AND BALANCE CHANGE RECORD

ASSOCIATE CONTRACTOR BOeing CONTRACT NO. WBS-1129-048
 COMPONENT SECTION 39 LOT NO. 11-18-63
 MODEL NO. WB-113A DRAWING NO. 25-37501-9
 SERIAL NO. 0000048 U.O. MISSILE CB/EM

APPROVED GO

EQUIPMENT CHANGE RECORD

PART NO.	DESCRIPTION OF EQUIPMENT	WEIGHT	WEIGHT AND BALANCE		
			X AXIS	Y AXIS	Z AXIS
ARM	ARM	ARM	ARM	ARM	ARM
225-37501-9	Instr. Group Trainer (As Weighed)	139.05	54.35	7,557.5	99.01
5				13,768.0	99.64
6				13,855.1	
7					
8					
9					
10					
11					
12	225-37501-9	143.62	54.76	7,864.2	99.46
13	Instr. Group Trainer (Complete)			14,284.1	99.82
14				14,336.6	
15					
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17.2 WEIGHT & BALANCE SUMMARY
TOTAL CTLI KIT INSTALLATION
CTLI WAVER S/N 0000049

REPORT NO. _____

DATE _____

LINE	N.	DESCRIPTION	DATA	EXPENDED WEIGHT (LB)	TOTAL WEIGHT (LB)	CENTER OF GRAVITY			INERTIA SLUG FT ² x 10 ⁻³	
						LONG.	LAT.	VERT.	ROLL	PITCH
1	41	RV Spacer								
2			Silo							
3			Aero							
4	39	CTLI Section			146.92	54.8	99.7	100.1	.004	.002
5			Silo							
6			Aero							
7	42	O&C Section			5.56	67.9	111.7	114.7	0	0
8			Silo							
9			Aero							
10	44	3rd Stage Engine			16.65	85.9	108.5	117.0	0	.002
11			Silo							
12			Aero							
13			Base							
14	45	Interstage 2-3 (Fwd)			- 1.32	56.3	109.8	117.7	0	0
15			Silo							
16			Aero							
17			Base							
18			Silo							
19		Jettisoned Portion	Aero							
20			Base							
21		Jett	- 1.32			56.3	109.8	117.7		
22	45	Interstage 2-3 (Aft)	Silo			18.64	64.7	111.8	120.2	0
23			Aero							
24			Base							
25	46	2nd Stage Engine			26.00	99.9	112.7	121.8	0	.009
26			Silo							
27			Aero							
28			Base							
29	47	Interstage 1-2 (Fwd)			- .98	58.2	113.6	123.8	0	0
30			Silo							
31			Aero							
32			Base							
33			Silo							
34		Jettisoned Portion	Aero							
35			Base							
36		Jett	- .98			58.2	113.6	123.8		
37	47	Interstage 1-2 (Aft)	Silo			25.26	74.0	114.8	125.2	0
38			Aero							
39			Base							
40	48	1st Stage Engine			26.70	117.2	117.7	130.1	0	.023
41			Silo							
42			Aero							
43			Base							
44	49	Skirt			7.78	74.5	118.1	129.6	0	0
45			Silo							
46			Aero							
47			Base							
48		MISSILE			271.21					
49			Silo							
50			Aero							
51			Base							
52			Jett							

* Boeing Section Stations (See Missile Station Diagram)

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17.2 WEIGHT & BALANCE SUMMARY CTLI (AVERAGE WEIGHT COMPONENTS)					REPORT NO. _____				
LINE NO.	DESCRIPTION	DATA	EXPENDED WEIGHT (LB)	TOTAL WEIGHT (LB)	CENTER OF GRAVITY			INERTIA SLUG FT ² x 10 ⁻³	
					LONG.	LAT.	VERT.	ROLL	PITCH
1 41	RV Spacer								
2		Silo							
3		Aero							
4 39	CTLI Section		3.42	56.9	108.4	112.4	0	0	
5		Silo							
6		Aero							
7 42	G&C Section		5.16	68.1	111.8	114.8	0	0	
8		Silo							
9		Aero							
10 44	3rd Stage Engine		16.45	86.0	108.5	117.0	0	.002	
11		Silo							
12		Aero							
13		Base							
14 45	Interstage 2-3 (Fwd)		- 1.52	55.9	109.9	117.6	0	0	
15		Silo							
16		Aero							
17		Base							
18		Silo							
19	Jettisoned Portion								
20		Aero							
21		Base							
22 45	Interstage 2-3 (Aft)		- 1.52	55.9	109.9	117.6	0	.001	
23		Silo							
24		Aero							
25 46	2nd Stage Engine		26.00	99.9	112.7	121.8	0	.009	
26		Silo							
27		Aero							
28		Base							
29 47	Interstage 1-2 (Fwd)		- .98	58.2	113.6	123.8	0	0	
30		Silo							
31		Aero							
32		Base							
33		Silo							
34	Jettisoned Portion								
35		Aero							
36		Base							
37 47	Interstage 1-2 (Aft)		- .98	58.2	113.6	123.8			
38		Silo							
39		Aero							
40 48	1st Stage Engine		24.76	73.6	115.1	125.6	0	.002	
41		Silo							
42		Aero							
43		Base							
44 49	Skirt		25.90	115.8	117.7	130.2	0	.023	
45		Silo							
46		Aero							
47		Base							
48	MISSILE		7.58	73.8	118.1	129.5	0	0	
49		Silo							
50		Aero							
51		Base							
52		Jett		125.21					

17.2 EMS 5-62 CHANGES INSTALLED AT VANDENBERG AIR FORCE BASE*					REPORT NO. _____							
LINE	ITEM	DESCRIPTION	DATA	EXPENDED WEIGHT (LB)	TOTAL WEIGHT (LB)			CENTER OF GRAVITY			INERTIA SLUG FT ² x 10 ⁻³	
					LONG.	LAT.	VERT.	ROLL	PITCH			
1	41	RV Spacer										
2			Silo									
3			Aero									
4	39	CTLI Section			.2	54.5	111.5	111.5				
5			Silo									
6			Aero									
7	42	OAC Section			.4	65.4	110.5	113.5				
8			Silo									
9			Aero									
10	44	3rd Stage Engine			.2	80.9	109.3	116.2				
11			Silo									
12			Aero									
13			Base									
14	45	Interstage 2-3 (Fwd)			.2	53.6	110.8	116.7				
15			Silo									
16			Aero									
17			Base									
18			Silo									
19		Jettisoned Portion										
20			Aero									
21			Base									
22	45	Interstage 2-3 (Aft)			.2	53.6	110.8	116.7				
23			Silo									
24			Aero									
25	46	2nd Stage Engine			0	-	-	-				
26			Silo									
27			Aero									
28			Base									
29	47	Interstage 1-2 (Fwd)			0	-	-	-				
30			Silo									
31			Aero									
32			Base									
33			Silo									
34		Jettisoned Portion										
35			Aero									
36			Base									
37	47	Interstage 1-2 (Aft)			.5	94.7	102.0	103.4				
38			Silo									
39			Aero									
40	48	1st Stage Engine			.8	161.3	116.2	128.0				
41			Silo									
42			Aero									
43			Base									
44	49	Skirt			.2	101.3	119.2	133.9				
45			Silo									
46			Aero									
47			Base									
48		MISSILE			2.7							
49			Silo									
50			Aero									
51			Base									
52			Jett									

* Reference DE-13943-534

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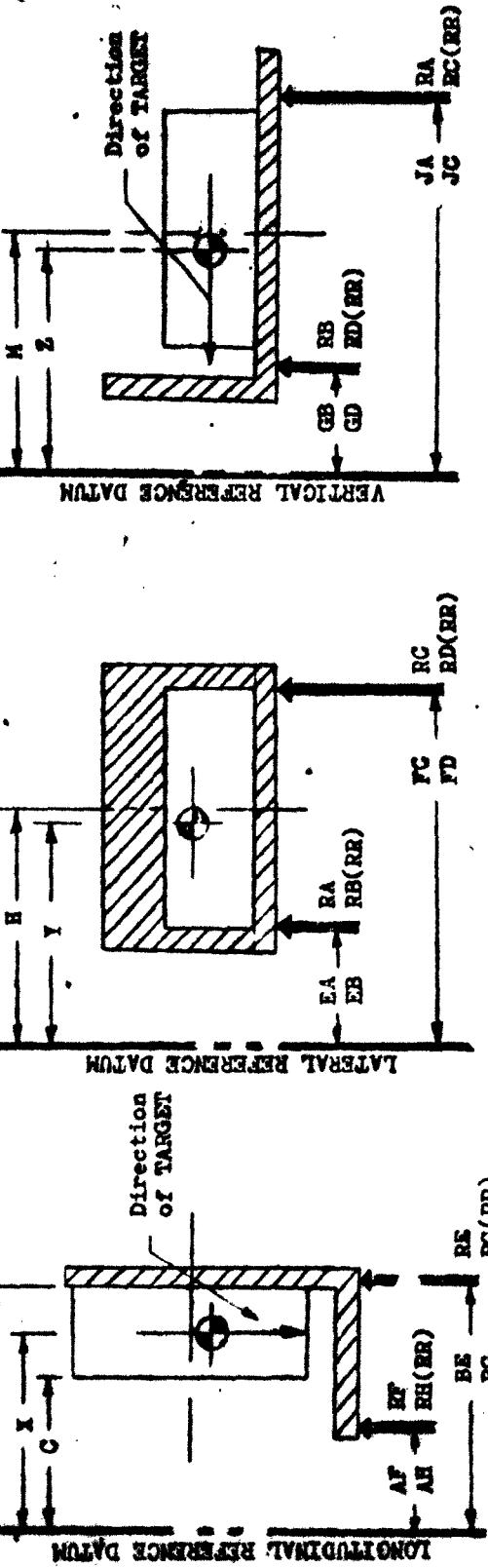
NO. DR-13943-2

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17.4.1

U/O MISSILE 0000049
MISSILE MODEL WB-133A
CONFIGURATION

ACTUAL WEIGHT RECORD - CELL SECTION

DRAWING NO. 25-31501-9
DCN B
ADCNCHECK LIST NO. 39
REPORTED BY 11/08
CHECKED BY 11/18/63PAGE NO. 11/08
DATE 11-18-63

WEIGHING DATA

REACTION	GR. WT.	TARE	CORR.	NET WT.	REACTION	GR. WT.	TARE	CORR.	NET WT.	REACTION	GR. WT.	TARE	CORR.	NET WT.
RF	16.75	22.30	26.45	20.45	FC	70.00	36.15		33.85	AF	42.00	24.50	34.50	77.475
RM	60.85	30.70	31.15	50.70	FD	83.95	52.60		31.35	AB	42.02	24.50	34.50	77.475
RE	110.90	64.65	46.25	64.65	RA	79.45	32.40		47.05	BE	62.99	41.49	34.50	915.500
RB	93.90	58.00	34.90	58.00	RB	81.80	55.30		26.50	BG	52.99	34.50	34.50	915.500
TOTAL	315.40	276.65	138.75	138.75	TOTAL	315.20	176.45		138.75	C	50.00	24.50	34.50	100.000
										D	60.00			

LATERAL C.G.				VERTICAL C.G.			
REACTION	NET WT.	ARM	MOMENT	REACTION	NET WT.	ARM	MOMENT
RF	26.45	12.00	31.50	RA	47.05	24.50	77.475
RM	32.15	12.02	38.50	RB	26.50	24.50	77.475
RE	46.25	12.00	54.00	RC	33.85	115.49	47.05
RB	34.90	12.00	47.05	RD	31.35	115.49	33.85
AS	200	139.75	7.52.3	AS	138.75	99.07	13,745.7
				AS	138.75	99.07	13,745.7

(RR) = Rear Reaction

2-5550-0-53 R1

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SERIAL NUMBER: 0000049

1743 MISSING PERSONS CHECK LIST

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3-5000-3-21

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~~SEARCHED~~ NO. 02-13943-2
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WEIGHT AND BALANCE CHANGE RECORD

WBS-1130-049

ASSOCIATE CONTRACTOR BOEING
 CONTRACT NO. SB-1010-39
 COMPONENT WB-133A
 MODEL NO. DRAWING NO. 25-37501-9
 SERIAL NO. U.O. MISSILE 0000049

REPORT NO. WBS-1130-049
 DATE 11/18/63
 PREPARED EC/GB
 APPROVED W

EQUIPMENT CHANGE RECORD

PART NO.	DESCRIPTION OF EQUIPMENT	WEIGHT	WEIGHT AND BALANCE		
			X AXIS	Y AXIS	Z AXIS
ARM	ARM	ARM	ARM	ARM	ARM
1	Instr. Group Trainer (As Weighed)	138.75	54.29	7.532.3	99.07
2				13.745.7	99.65
3					13.826.1
4					
5	ATD: Cable-Autometrics	3.21	74.2	115.5	102.8
6	Cable-Autometrics	1.34	50.4	106.2	111.4
7					
8					
9					
10					
11	Instr. Group Trainer (Complete)	143.30	54.70	7.838.0	99.51
12	25-37501-9			14.259.7	99.83
13					14.305.4
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
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29					
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32					

2-5550-0-11 R1

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NO. DE-13943-2

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17.5

**ENGINEERING CHANGE PROPOSAL (ECP) INCORPORATION
APPLICABLE TO CTLI SECTION S/N 0000049 AND INSTALLATION KIT**

The following ECP's have not been incorporated into "Model Specification, Trainer-Test Group, Guided Missile, (S-133-1006-0-1)".

ECP NO. (WS-133A-BO-)	ECP TITLE	STAGE	WEIGHT CHANGE	WEIGHT CHANGE INCORPORATED IN THIS REPORT
540	Potting & Bonding Deletions for Vandenberg Air Force Base Missiles	All	-	No*
606	Revision to CTLI Umbilical Bracket-Section 49	1	Negl.	Yes
620	Addition of Static Dissipators on 47 Section & Section 49	1	Negl.	Yes
635	PCM R/F Section Digital Data Programmer	3	Negl.	Yes
639	Prevent Interference of Linear Shape Charge with Cable Strap	3	Negl.	Yes
657	Revision of Ordnance Supports in Interstage 2-3	2	Negl.	Yes
660	Wing III GMC Section & Raceway Raceway Interface Revisions	3	Negl.	Yes

Mass properties of other applicable ECP's have been incorporated

* ECP 540 transfers the responsibility for sealing the raceway covers from Plant 77 to Vandenberg. However, the weight is still considered part of the operational missile and is not included in this report.

CTLI SECTION, S/N 0000050

18.1. This section of the document describes the data changes created by converting a production line Minuteman missile into a CTLI missile. The mass data reported herein reflect the predicted net changes to be applied to the total missile mass properties when this CTLI section and the related downstage components are installed on a missile. A supplemental report (see reference 1.1.6) will be issued at Vandenberg Air Force Base when this CTLI section is actually used on a missile. This supplemental report will reflect the actual data gathered on base during the installation and will thus supersede parts of this report. However, past experience has shown that the changes between these two reports will be slight.

The data on the following pages consist of weight and balance summaries, check lists, and ECP's lists applicable to this installation. Page 175 summarizes the complete installation mass properties and consists of data from page 176 (average mass properties of downstage components), page 177 (predicted sealant changes), and page 181 (actual weight of CTLI section S/N 0000050). In addition, page 178 presents summary check lists by production section as backup data for page 176. Page 182 lists the engineering change proposals incorporated on the components used for this installation.

All data reported in this section of the document reflect the use of a linear shaped charge destruct system on the first stage engine per ECP 116.

Aerojet weights used in this report reflect the data transmitted to Boeing by Aerojet document 0162-01DR-~~MPD~~-1, "Nominal Mass Properties and Dispersions for Minuteman CTLI/AODS" dated January 28, 1963.

Average values have been used for all Boeing items other than the CTLI section which is an actual weight.

The following drawings are incorporated in the above section:

10-20942, Battery Instl., Rev H 6-10-63.
21-52900, Missile Instl., Rev K 9-19-63.
25-25406, BMS 5-62 Instl., DCN J 9-13-63.
25-26878, Cable Assy., DCN J 9-3-63.
25-37060, Conduit Assy. DCN B 9-10-63, ADCN S-20 10-22-63.
25-37236, Instl. Kit, DCN C 6-28-63.
25-37237, Conduit Supt Set, DCN A 5-10-63.
25-37501, 39 Sect. Instl., DCN C 11-5-63.
29-22327, Timer Instl., DCN D 6-24-63 ADCN S-6 9-5-63.

18.1 WEIGHT & BALANCE SUMMARY TOTAL CTDI KIT INSTALLATION CTDI WAFER S/N 0000050					REPORT NO. _____						
ITEM	SECTION	DESCRIPTION	DATA	EXPENDED WEIGHT (LB)	TOTAL WEIGHT (LB)	CENTER OF GRAVITY			INERTIA SLUG FT ² x10 ⁻³		
						LONG.	LAT.	VERT.	ROLL	PITCH	
1	41	IV Spacer									
2			Silo								
3			Aero								
4	39	CTDI Section			146.97	54.8	99.7	100.1	.004	.002	
5			Silo								
6			Aero								
7	42	O&C Section			5.56	67.9	111.7	114.7	0	0	
8			Silo								
9			Aero								
10	44	3rd Stage Engine			16.65	85.9	108.5	117.0	0	.002	
11			Silo								
12			Aero								
13			Base								
14	45	Interstage 2-3 (Fwd)			- 1.32	56.3	109.8	117.7	0	0	
15			Silo								
16			Aero								
17			Base								
18			Silo								
19		Jettisoned Portion									
20			Aero								
21			Base								
22	45	Interstage 2-3 (Aft)			- 1.32	56.3	109.8	117.7	0	.001	
23			Silo								
24			Aero								
25	46	2nd Stage Engine			26.00	99.9	112.7	121.8	0	.009	
26			Silo								
27			Aero								
28			Base								
29	42	Interstage 1-2 (Fwd)			- .98	58.2	113.6	123.8	0	0	
30			Silo								
31			Aero								
32			Base								
33			Silo								
34		Jettisoned Portion									
35			Aero								
36			Base								
37	47	Interstage 1-2 (Aft)			- .98	58.2	113.6	123.8	0	.002	
38			Silo								
39			Aero								
40	48	1st Stage Engine			26.70	117.2	117.7	130.1	0	.023	
41			Silo								
42			Aero								
43			Base								
44	49	Skirt				7.78	74.5	118.1	129.6	0	0
45			Silo								
46			Aero								
47			Base								
48		MISSILE				271.26					
49			Silo								
50			Aero								
51			Base								
52			Jett								

* Boeing Section Stations (See Missile Station Diagram)
2-5550-0-58

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18.2 WEIGHT & BALANCE SUMMARY CTLI (AVERAGE WEIGHT COMPONENTS)					REPORT NO. _____					
LINE	ITEM	DESCRIPTION	DATA	EXPENDED WEIGHT (LB)	TOTAL WEIGHT (LB)	CENTER OF GRAVITY			INERTIA SLUG FT ² x10 ⁻³	
						LONG.	LAT.	VERT.	ROLL	PITCH
1	41	IV Spacer								
2		Silo								
3		Aero								
4	39	CTLI Section			3.42	56.9	108.4	112.4	0	0
5		Silo								
6		Aero								
7	42	G&C Section			5.16	68.1	111.8	114.8	0	0
8		Silo								
9		Aero								
10	44	3rd Stage Engine			16.45	86.0	108.5	117.0	0	.002
11		Silo								
12		Aero								
13		Base								
14	45	Interstage 2-3			- 1.52	55.9	109.9	117.6	0	0
15		(Fwd)								
16		Silo								
17		Aero								
18		Base								
19		Silo								
20		Aero								
21		Base								
22	45	Interstage 2-3			18.44	64.8	111.8	120.2	0	.001
23		(Aft)								
24		Silo								
25	46	2nd Stage Engine			26.00	99.9	112.7	121.8	0	.009
26		Silo								
27		Aero								
28		Base								
29	47	Interstage 1-2			- .98	58.2	113.6	123.8	0	0
30		(Fwd)								
31		Silo								
32		Aero								
33		Base								
34		Silo								
35		Aero								
36		Base								
37	47	Interstage 1-2			- .98	58.2	113.6	123.8		
38		(Aft)								
39		Silo								
40	48	1st Stage Engine			24.76	73.6	115.1	125.6	0	.002
41		Silo								
42		Aero								
43		Base								
44	49	Skirt			25.90	115.8	117.7	130.2	0	.023
45		Silo								
46		Aero								
47		Base								
48		MISSILE			125.21					
49		Silo								
50		Aero								
51		Base								
52		Jett								

18.2 EMS 5-62 CHARGES INSTALLED AT VANDEBERG AIR FORCE BASE*					REPORT NO. _____				
ITEM NO.	DESCRIPTION	DATA	EXPENDED WEIGHT (LB)	TOTAL WEIGHT (LB)	CENTER OF GRAVITY			INERTIA SLUG FT ² x 10 ⁻³	
					LONG.	LAT.	VERT.	ROLL	PITCH
1 41	RV Spacer								
2		Silo							
3		Aero							
4 39	CTLI Section			.2	54.5	111.5	111.5		
5		Silo							
6		Aero							
7 42	U&C Section		.4		65.4	110.5	113.5		
8		Silo							
9		Aero							
10 44	3rd Stage Engine			.2	80.9	109.3	116.2		
11		Silo							
12		Aero							
13		Base							
14 45	Interstage 2-3 (Fwd)			.2	53.6	110.8	116.7		
15		Silo							
16		Aero							
17		Base							
18		Silo							
19	Jettisoned Portion								
20		Aero							
21		Base							
22 45	Interstage 2-3 (Aft)			.2	53.6	110.8	116.7		
23		Silo							
24		Aero							
25 46	2nd Stage Engine			0	-	-	-		
26		Silo							
27		Aero							
28		Base							
29 47	Interstage 1-2 (Fwd)			0	-	-	-		
30		Silo							
31		Aero							
32		Base							
33		Silo							
34	Jettisoned Portion								
35		Aero							
36		Base							
37 47	Interstage 1-2 (Aft)			.5	94.7	102.0	103.4		
38		Silo							
39		Aero							
40 48	1st Stage Engine			.8	161.3	116.2	128.0		
41		Silo							
42		Aero							
43		Base							
44 49	Skirt			.2	101.3	119.2	133.9		
45		Silo							
46		Aero							
47		Base							
48	MISSILE			2.7					
49		Silo							
50		Aero							
51		Base							
52		Jett							

2-5550-0-58 * Reference D2-13954-534

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CHECK LIST NO. 39	MISSILE WEIGHING CHECK LIST	RECORD OF CHECKING (DATE)		
		No	12	
		Day	2	
DATE	MODEL WS-133A	Yr	63	
	ITEM NUMBER	ITEM NUMBER	ITEM NUMBER	ITEM NUMBER
	SECTION 39	MISSILE COMPONENT	MISSILE NO. _____	MISSILE NO. _____
		DESCRIPTION	PART NO.	WEIGHT
39	Instrumentation Group, Trainer Test	25-37501-9		
39a	CPU Structure Assembly	25-25403-11		
	Support Structure	25-28094-45		
	Primary Structure	25-28093-15		
	Insulation & External Matting	25-28095-3		
	Antenna & Spacer	25-28096-3		
	Plate - Identification	21-51600-29		
39b	Cable & Equipment Installation	25-25404-15		
	Battery, Small	10-20942-1		
	Battery, Small	10-20942-2		
	Cable Set 8E-353	55018-106		
	Cable	AN 37192-315		
	Cable	AN 37194-315		
	Cable	AN 37196-315		

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18.4.3

WEIGHT AND BALANCE CHANGE RECORD

ASSOCIATE CONTRACTOR	BOEING	CONTRACT NO.		REPORT NO.	WBS-11-32-050
COMPONENT	SECTION 39	LOT NO.		DATE	11/2/63
MODEL NO.	WB-133A	DRAWING NO.	25-37501-9	PREPARED	CB
SERIAL NO.	0000050	U.O. MISSILE		APPROVED	60

EQUIPMENT CHANGE RECORD

LINE NO.	DESCRIPTION OF EQUIPMENT	WEIGHT AND BALANCE			
		WEIGHT	X AXIS ARM MOMENT	Y AXIS ARM MOMENT	Z AXIS ARM MOMENT
1	25-37501-9 Instr. Group Trainer (As Weighed)	138.80	54.31	7,537.6	99.04
2				13,746.7	99.60
3					13,824.3
4					
5					
6	AN37194-315 Cable-Autometrics	3.22	74.2	115.5	102.8
7	AN37196-315 Cable-Autometrics	1.33	50.4	106.9	111.4
8					
9					
10					
11	25-37501-9 Instr. Group Trainer (Complete)	143.35	54.72	7,843.6	99.48
12				14,260.8	99.78
13					14,303.5
14					
15					
16					
17					
18					
19					
20					
21					
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23					
24					
25					
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29					
30					
31					
32					

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18.5

**ENGINEERING CHANGE PROPOSAL (ECP) INCORPORATION
APPLICABLE TO CTLI SECTION S/N 0000050 AND INSTALLATION KIT**

The following ECP's have not been incorporated into "Model Specification, Trainer-Test Group, Guided Missile, (S-133-1006-0-1)".

ECP NO. (WS-133A-BO-)	ECP TITLE	STAGE	WEIGHT CHANGE	WEIGHT CHANGE INCORPORATED IN THIS REPORT
540	Potting & Bonding Deletions for Vandenberg Air Force Base Missiles	All	-	No*
606	Revision to CTLI Umbilical Bracket-Section 49	1	Negl.	Yes
620	Addition of Static Dissipators on 47 Section & Section 49	1	Negl.	Yes
635	PCM R/F Section Digital Data Programmer	3	Negl.	Yes
639	Prevent Interference of Linear Shape Charge with Cable Strap	3	Negl.	Yes
657	Revision of Ordnance Supports in Interstage 2-3	2	Negl.	Yes
660	Wing III G&C Section & Raceway Interface Revisions	3	Negl.	Yes

Mass properties of other applicable ECP's have been incorporated

* ECP 540 transfers the responsibility for sealing the raceway covers from Plant 77 to Vandenberg. However, the weight is still considered part of the operational missile and is not included in this report.

CTLI SECTION, S/N 0000051

19.1 This section of the document describes the data changes created by converting a production line Minuteman missile into a CTLI missile. The mass data reported herein reflect the predicted net changes to be applied to the total missile mass properties when this CTLI section and the related downstage components are installed on a missile. A supplemental report (see reference 1.1.6) will be issued at Vandenberg Air Force Base when this CTLI section is actually used on a missile. This supplemental report will reflect the actual data gathered on base during the installation and will thus supersede parts of this report. However, past experience has shown that the changes between these two reports will be slight.

The data on the following pages consists of weight and balance summaries check lists, and ECP's lists applicable to this installation. Page 184 summarizes the complete installation mass properties and consists of data from page 185 (average mass properties of downstage components), page 186 (predicted sealant changes), and page 190 (actual weight of CTLI section S/N 0000051). In addition, page 187 presents summary check lists by production section as backup data for page 185. Page 191 lists the engineering change proposals incorporated on the components used for this installation.

All data reported in this section of the document reflect the use of a linear shaped charge destruct system on the first stage engine per ECP 116.

Aerojet weights used in this report reflect the data transmitted to Boeing by Aerojet document 0162-OLDR-NMPD-1, "Nominal Mass Properties and Dispersions for Minuteman CTLI/AODS" dated January 28, 1963.

Average values have been used for all Boeing items other than the CTLI section which is an actual weight.

The following drawings are incorporated in the above section:

10-20942, Battery Instl., Rev. H 6-10-63.
21-52900, Missile Instl., Rev. K 9-19-63.
25-25406, BMS 5-62 Instl., DCN J 9-13-63.
25-26878, Cable Assy., DCN J 9-13-63.
25-37060, Conduit Assy., DCN B 9-10-63, ADCN S-20 10-22-63.
25-37236, Instl. Kit DCN C 6-28-63.
25-37237, Conduit Supt. Set, DCN A 5-10-63.
25-37501, 39 Sect. Instl., DCN C 11-5-63.
29-22327, Timer Instl., DCN D 6-24-63, ADCN S-6 9-5-63.

19.2 WEIGHT & BALANCE SUMMARY TOTAL CTLI KIT INSTALLATION CTLI WAFER S/N 0000051					REPORT NO. _____ DATE _____					
ITEM	S/N	DESCRIPTION	DATA	EXPENDED WEIGHT (LB)	TOTAL WEIGHT (LB)	CENTER OF GRAVITY			INERTIA SLUG FT ² x 10 ⁻³	
						LONG.	LAT.	VERT.	ROLL	PITCH
1	41	RV Spacer								
2			Silo							
3			Aero							
4	39	CTLI Section			146.61	54.7	99.7	100.1	.004	.002
5			Silo							
6			Aero							
7	42	G&C Section			5.56	67.9	111.7	114.7	0	0
8			Silo							
9			Aero							
10	44	3rd Stage Engine			16.65	85.9	108.5	117.0	0	.002
11			Silo							
12			Aero							
13			Base							
14	45	Interstage 2-3 (Fwd)			- 1.32	56.3	109.8	117.7	0	0
15			Silo							
16			Aero							
17			Base							
18			Silo							
19		Jettisoned Portion	Aero							
20			Base							
21			Jett	- 1.32		56.3	109.8	117.7		
22	45	Interstage 2-3 (Aft)			18.64	64.7	111.8	120.2	0	.001
23			Silo							
24			Aero							
25	46	2nd Stage Engine			26.00	99.9	112.7	121.8	0	.009
26			Silo							
27			Aero							
28			Base							
29	47	Interstage 1-2 (Fwd)			- .98	58.2	113.6	123.8	0	0
30			Silo							
31			Aero							
32			Base							
33			Silo							
34		Jettisoned Portion	Aero							
35			Base							
36			Jett	- .98		58.2	113.6	123.8		
37	47	Interstage 1-2 (Aft)			25.26	74.0	114.8	125.2	0	.002
38			Silo							
39			Aero							
40	48	1st Stage Engine			26.70	117.2	117.7	130.1	0	.023
41			Silo							
42			Aero							
43			Base							
44	49	Skirt			7.78	74.5	118.1	129.6	0	0
45			Silo							
46			Aero							
47			Base							
48		MISSILE			270.90					
49			Silo							
50			Aero							
51			Base							
52			Jett							

* Boeing Section Stations (See Missile Station Diagram)

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19.2 WEIGHT & BALANCE SUMMARY CTLI
(AVERAGE WEIGHT COMPONENTS)

REPORT NO. _____

DATE _____

ITEM	DESCRIPTION	DATA	EXPENDED WEIGHT (LB)	TOTAL WEIGHT (LB)	CENTER OF GRAVITY			INERTIA SLUG FT ² x 10 ⁻³	
					LONG.	LAT.	VERT.	ROLL	PITCH
1 41	RV Specer								
2		Silo							
3		Aero							
4 39	CTLI Section			3.42	56.9	108.4	112.4	0	0
5		Silo							
6		Aero							
7 42	O&C Section			5.16	68.1	111.8	114.8	0	0
8		Silo							
9		Aero							
10 44	3rd Stage Engine			16.45	86.0	108.5	117.0	0	.002
11		Silo							
12		Aero							
13		Base							
14 45	Interstage 2-3 (Fwd)			- 1.52	55.9	109.9	117.6	0	0
15		Silo							
16		Aero							
17		Base							
18		Silo							
19	Jettisoned Portion								
20		Aero							
21		Base							
22		Jett	- 1.52		55.9	109.9	117.6		
23 45	Interstage 2-3 (Aft)			18.44	64.8	111.3	120.2	0	.001
24		Silo							
25		Aero							
26 46	2nd Stage Engine			26.00	99.9	112.7	121.8	0	.009
27		Silo							
28		Aero							
29		Base							
30 47	Interstage 1-2 (Fwd)			- .98	58.2	113.6	123.8	0	0
31		Silo							
32		Aero							
33		Base							
34		Silo							
35	Jettisoned Portion								
36		Aero							
37		Base							
38		Jett	- .98		58.2	113.6	123.8		
39 47	Interstage 1-2 (Aft)			24.76	73.6	115.1	125.6	0	.002
40		Silo							
41		Aero							
42 48	1st Stage Engine			25.90	115.8	117.7	130.2	0	.023
43		Silo							
44		Aero							
45		Base							
46 49	Skirt			7.58	73.8	118.1	129.5	0	0
47		Silo							
48		Aero							
49		Base							
50									
51									
52									
	MISSILE			125.21					
		Silo							
		Aero							
		Base							
		Jett							

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REV. SYM. F

BOEING

VOL

NO D2-13943-2

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19.2 EMS 5-62 CHANCES INSTALLED AT VANDENBERG AIR FORCE BASE*					REPORT NO. _____				
ITEM	DESCRIPTION	DATA	EXPENDED WEIGHT (LB)	TOTAL WEIGHT (LB)	CENTER OF GRAVITY			INERTIA SLUG FT ² x 10 ⁻³	
					LONG.	LAT.	VERT.	ROLL	PITCH
1 41	RV Spacer								
2		Silo							
3		Aero							
4 39	CTLI Section			.2	54.5	111.5	111.5		
5		Silo							
6		Aero							
7 42	G&C Section			.4	65.4	110.5	113.5		
8		Silo							
9		Aero							
10 44	3rd Stage Engine			.2	80.2	109.3	116.2		
11		Silo							
12		Aero							
13		Base							
14 45	Interstage 2-3 (Fwd)			.2	53.6	110.8	116.7		
15		Silo							
16		Aero							
17		Base							
18		Silo							
19	Jettisoned Portion								
20		Aero							
21		Base							
22 45	Interstage 2-3 (Aft)			.2	53.6	110.8	116.7		
23		Silo							
24		Aero							
25 46	2nd Stage Engine			0	-	-	-		
26		Silo							
27		Aero							
28		Base							
29 47	Interstage 1-2 (Fwd)			0	-	-	-		
30		Silo							
31		Aero							
32		Base							
33		Silo							
34	Jettisoned Portion								
35		Aero							
36		Base							
37 42	Interstage 1-2 (Aft)			.5	94.7	102.0	103.4		
38		Silo							
39		Aero							
40 48	1st Stage Engine			.8	161.3	116.2	128.0		
41		Silo							
42		Aero							
43		Base							
44 49	Skirt			.2	101.3	119.2	133.9		
45		Silo							
46		Aero							
47		Base							
48	MISSILE			2.7					
49		Silo							
50		Aero							
51		Base							
52		Jett							

2-5550-0-58 * Reference D2-13954-534

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REV. EDL. P.

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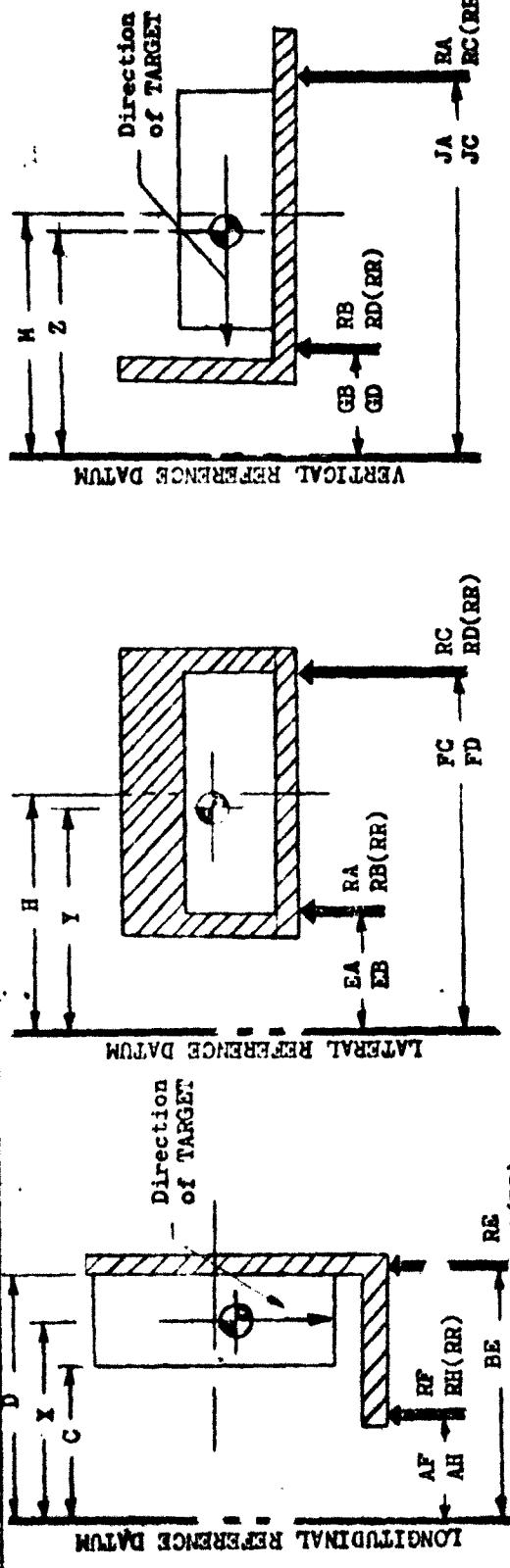
19.4.1

U/O MISSILE 0000051
MISSILE MODEL MB-133A
CONFIGURATION

DRAWING NO. 25-37501-2
DCN B
ADCN

ACTUAL WEIGHT RECORD - CTDJ SECTION

CHECK LIST NO. 39
REPORTED BY CB/G
CHECKED BY M
PAGE NO. 12/10/63
DATE



WEIGHING DATA

REACTION	GR. WT.	TARE	CORR.	NET WT.	REACTION	GR. WT.	TARE	CORR.	NET WT.
RF	43.65	18.60		25.05	RC	73.15	40.15		33.00
RD	66.25	33.60		32.65	RD	80.30	48.45		31.85
RE	116.85	68.70		48.15	RA	76.00	28.35		47.65
RG	88.20	55.60		32.60	RB	85.55	59.60		25.95
TOTAL	314.95	176.90		138.45	TOTAL	315.00	176.55		138.45

DIMENSIONAL DATA

DIM.	INCHES	DIM.	INCHES	DIM.	INCHES
AF	42.007	EA	84.50	GB	77.45
AH	42.023	EB	84.505	GD	77.45
BE	62.994	FC	115.490	JA	115.200
BG	62.994	FD	115.495	JG	115.200
RF	50.000	C	100.000	H	100.000
RD	60.000	D	60.000		

LONGITUDINAL C.G.

REACTION	NET WT.	ARM	MOMENT	REACTION	NET WT.	ARM	MOMENT	REACTION	NET WT.	ARM	MOMENT
RF	25.05	42.007		RA	47.65	84.510		RB	25.95	77.478	
RD	32.65	42.023		RB	25.95	84.505		RD	31.85	77.480	
RE	48.15	62.994		RC	33.00	115.490		RA	47.65	115.500	
RG	32.60	62.994		RD	31.85	115.495		RC	33.00	115.500	
AS	138.45	7.511.4		AS	138.45	99.02	13.709.5	AS	138.45	99.63	13.793.4

(RR) = Rear Reaction

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NO. DR-13943-2

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SERIAL NUMBER: 0000051

ITEM NUMBER	DESCRIPTION	MISSILE NO. _____			COMPONENT PART NO. _____			MISSILE		
		SECTION 39			MISSILE			COMPONENT		
		AS RECEIVED	SHIPPING	WEIGHT	AS RECEIVED	SHIPPING	WEIGHT	AS RECEIVED	SHIPPING	WEIGHT
39	Instrumentation Group, Trainer-Test	25-37501-9								
39a	CMU Structure Assembly	25-25403-11								
	Support Structure	25-29094-45						X	X	
	Primary Structure	25-29093-15						X	X	
	Engulation & External Matting	25-29095-3						X	X	
	Antenna & Spacer	25-29096-3						X	X	
	Plate - Identification	21-51600-329						X	X	
39b	Cable & Equipment Installation	25-25404-15								
	Battery, Small	10-20942-4						X	X	
	Battery, Small	10-20942-2						X	X	
	Cable Set, SLE-358	55018-106						-	-	
	Cable	AN 37192-315						X	X	
	Cable	AN 37194-315						X	O	
	Cable	AN 37196-315						X	O	

2-5880-0-21

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WEIGHT AND BALANCE CHANGE RECORD

ASSOCIATE CONTRACTOR	BOEING	CONTRACT NO.	WBS-1147-051
COMPONENT	SECTION 39	LOT NO.	12/10/63
MODEL NO.	WB-133A	DRAWING NO.	CB
SERIAL NO.		U.O. MISSILE	APPROVED

WEIGHT AND BALANCE CHANGE RECORD		WEIGHT AND BALANCE	
EQUIPMENT CHANGE RECORD		WEIGHT AND BALANCE	
PART NO.	DESCRIPTION OF EQUIPMENT	WEIGHT	
		ARM	moment
225-37501-9	Instr. Group Trainer (As Weighed)	54.25	7,211.4
4			99.02
5	ADD:		
6	AN37194-315	3.19	74.2
7	AN37196-315	1.35	50.4
8	Cable-Autometrics		
9	Cable-Autometrics		
10			
11	225-37501-9 Instr. Group Trainer (Complete)	142.99	54.66
12			
13			
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2-5550-0-11 R1

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19.5

**ENGINEERING CHANGE PROPOSAL (ECP) INCORPORATION
APPLICABLE TO CTLI SECTION S/N 0000051 AND INSTALLATION KIT**

The following ECP's have not been incorporated into "Model Specification, Trainer-Test Group, Guided Missile, (S-133-1006-0-1)".

ECP NO. (WS-133A-BO-)	ECP TITLE	STAGE	WEIGHT CHANGE	WEIGHT CHANGE INCORPORATED IN THIS REPORT
540	Potting & Bonding Deletions for Vandenberg Air Force Base Missiles	All	-	No*
606	Revision to CTLI Umbilical Bracket Section 49	1	Negl.	Yes
620	Addition of Static Dissipators on 47 Section & Section 49	1	Negl.	Yes
635	PCM R/F Section Digital Data Programmer	3	Negl.	Yes
639	Prevent Interference of Linear Shape Charge with Cable Strap	3	Negl.	Yes
657	Revision of Ordnance Supports in Interstage 2-3	2	Negl.	Yes
660	Wing III G&C Section & Raceway Interface Revisions	3	Negl.	Yes

Mass properties of other applicable ECP's have been incorporated

* ECP 540 transfers the responsibility for sealing the raceway covers from Plant 77 to Vandenberg. However, the weight is still considered part of the operational missile and is not included in this report.

AD 406916

END CHANGE PAGES